

# MELBOURNE METRO RAIL PROJECT SOUTH YARRA STATION OPTIONS ASSESSMENT

June 2015



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# 1. Executive summary

The Melbourne Metro Rail Authority has, in consultation with Public Transport Victoria, assessed potential options for including a South Yarra interchange station within the scope of the Melbourne Metro Rail Project.

The key findings of this options assessment are summarised below:

- The inclusion of a Melbourne Metro station at South Yarra is expected to add in the order of \$700 million to \$970 million to the capital cost of the project.
- The economic case for including a new station is poor, with a benefit cost ratio (BCR) of approximately 0.2. Adding the station has an economic impact of -\$535 million (net present value). The overall economic result of the Melbourne Metro project is higher with no station at South Yarra (i.e. the inclusion of a South Yarra interchange station would reduce the project's BCR).
- South Yarra is well serviced by public transport, even without a new Melbourne Metro station.

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- Over 100,000 customers per day would be a minute worse off if the South Yarra Interchange Station is included, compared to less than 14,000 customers who would be between one and ten minutes better off. In aggregate (i.e. taking into account all journey time savings and all slower journey times), the addition of a new station at South Yarra would add an additional 1,500 hours of travel time per day for public transport users in 2031.
- The construction of a new station at South Yarra would result in significant additional disruption for the local community. For example, the construction of a new station which enables direct interchange with the existing station is expected to involve:
  - The partial closure of Chapel Street Bridge for approximately 12 months, affecting road users, the route 78 tram, pedestrians and the Chapel Street precinct more broadly (whereas Chapel Street Bridge is expected to be unaffected if there is no new station); and
  - The acquisition of an additional 69 residential and 25 commercial titles at surface (including partial acquisition of the Jam Factory) compared to the project with no new station at South Yarra. An alternative to acquiring the Jam Factory would be to acquire a new block of apartments, requiring the full acquisition of 2 fewer commercial titles but 147 additional residential titles.

As such, it is recommended that the Melbourne Metro Rail Project should proceed without a new station at South Yarra.



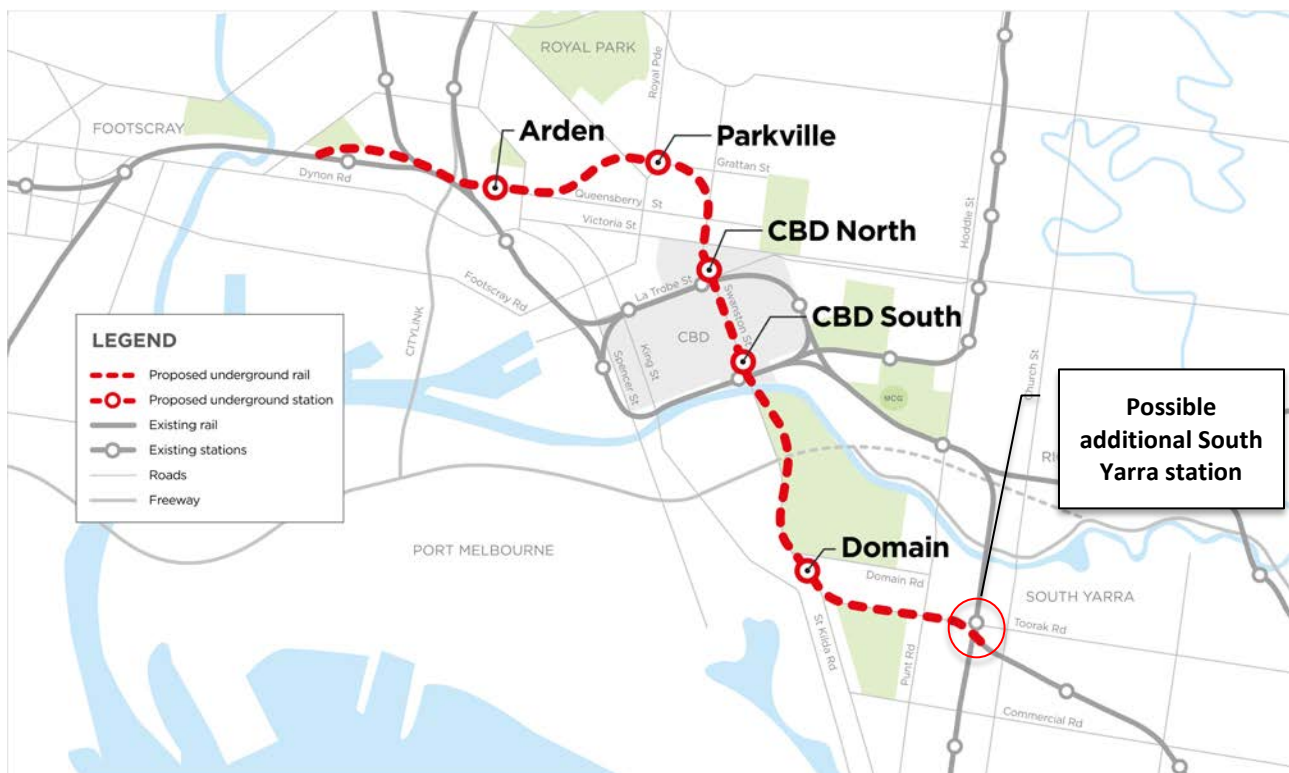
## 2. Introduction

### 2.1. The Melbourne Metro Rail Project

The Melbourne Metro Rail Project will increase the capacity, reliability and efficiency of train lines serving Melbourne's growth areas in the north, west and south-east. It is currently envisaged that the project will deliver:

- Two nine-kilometre rail tunnels from South Kensington to South Yarra as part of a new Sunbury to Cranbourne/Pakenham line;
- New underground stations at Arden, Parkville, CBD North, CBD South and Domain;
- Train/tram interchanges at Parkville and Domain; and
- Rail tunnel entrances (portals) at South Kensington and South Yarra.

Figure 2-1: Overview of current Melbourne Metro Rail Project scope, with a possible station at South Yarra added



### 2.2. Purpose of this report

The current Melbourne Metro concept does not include the creation of a new interchange station at South Yarra, meaning that trains on the Sunbury to Cranbourne/Pakenham line will not stop at South Yarra.

This report has been prepared by the Melbourne Metro Rail Authority (MMRA) in consultation with Public Transport Victoria (PTV) to summarise the assessment of potential options for the inclusion of a South Yarra interchange station as part of the Melbourne Metro Rail Project. The purpose of the report is to inform Government decision making and seek confirmation of the project scope.

## 2.3. History

Numerous options for a Melbourne rail tunnel project have been considered over the last decade, including as part of the Eddington study which contemplated an alignment which bypassed South Yarra altogether. An earlier concept for the Melbourne Metro project was – for a time – scoped, designed and modelled on the basis that a South Yarra interchange would be built. However, further assessments revealed that the South Yarra interchange station:

- Had relatively low patronage compared to other key stations on the Sunbury-Dandenong corridor due to the interchange functionality being available to customers elsewhere in the network;
- Came at a relatively high cost; and
- Involved extensive land acquisition and disruption.

This led to the South Yarra interchange station having a poor economic case. The project was therefore taken forward without a South Yarra interchange station.

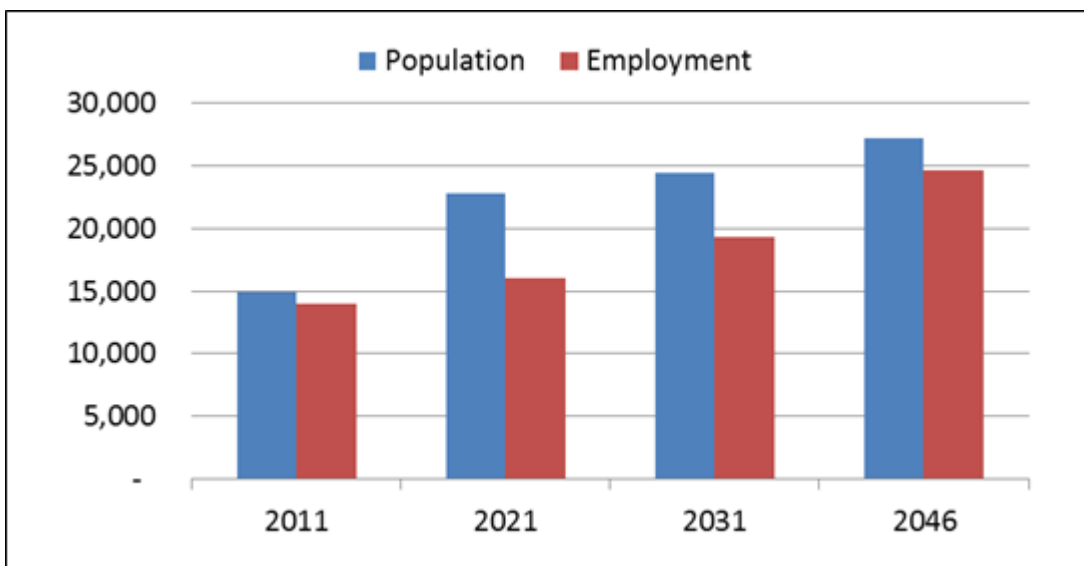
This previous analysis was considered in determining the current project scope and has been revisited as part of this options assessment process.

## 2.4. Local context

South Yarra is an important residential area and activity centre, notably the Chapel Street precinct and along Toorak Road. In recent years the area has experienced higher density development and this trend is expected to continue. By 2046, the area within walking distance of South Yarra Station is projected to gain around 10,000 jobs and 12,000 residents. Most of this residential growth is projected to occur by 2021.

Recent and projected residential and employment figures for South Yarra are summarised in the chart below.

**Figure 2-2: South Yarra population and employment**



Source: PTV based on data from *Victoria in Future 2014*

South Yarra is currently very well serviced by public transport, including by train at the existing South Yarra Station (Pakenham, Cranbourne, Frankston and Sandringham lines), tram (currently routes 8, 72 and 78<sup>1</sup>) and bus (including major routes along Commercial Road and Punt Road).

Local stakeholders have for a number of years articulated a preference for the inclusion of an interchange station at South Yarra. Primary concerns have included:

<sup>1</sup> Planned tram timetable changes will result in route 8 being discontinued. However, route 55 will be modified and will run from West Coburg to Toorak, replacing the current route 8 service along Toorak Road between Toorak and Domain.



- Exclusion of a station appears to be at odds with moving to a “metro style” network with lots of interchange opportunities; and
- The extent of recent development activity in the area suggests that more train services should stop at South Yarra.

This local context and these stakeholder views have been considered in developing this options assessment.



## 3. Overview of station options

### 3.1. Options considered

The previous work referred to in Section 2.3 considered a broad range of potential station locations, including:

- The provision of new platforms under or adjacent to the existing station;
- A new station at the Jam Factory (no interchange with existing station); and
- A new station south of Toorak Road.

Options south of Toorak Road were found to be cheaper, less disruptive to build and better able to preserve an alignment that allows Domain Station to be optimally located. Therefore, the current options assessment process has focused solely on options to the south of Toorak Road.

Four potential options have been developed and considered for the purposes of this current options assessment. All four of these options involve the provision of two new platforms at South Yarra with the new Melbourne Metro lines connecting to the existing Dandenong rail lines south of the existing South Yarra Station. Analysis of these options has been undertaken by MMRA's technical advisers (with input from PTV) and the findings have been documented in the South Yarra MM Platforms – Technical Options Report (2015). This report considers the station arrangements, customer experience, certain operational implications (such as rail geometry and operational speed), planning considerations, constructability, property impacts, disruption and capital cost implications for the four potential options.

The study concludes that two of the options provide suitable examples to set out the range of potential capital costs and other key implications for the purposes of assessing the merits of adding an interchange station at South Yarra. This report therefore focuses on comparing these two example options to the “base case” (i.e. the current project scope, with no interchange station at South Yarra).

#### **Status of design and technical analysis**

The design and technical work undertaken to inform this report is preliminary in nature. While it is suitable to inform an investment decision, the drawings and figures in this report are indicative and further work would be required to progress any of the options outlined in this report towards delivery. More detailed assessment of all potential options will be warranted if it is proposed to include a Melbourne Metro station at South Yarra.

### 3.2. The Base Case: no Melbourne Metro station at South Yarra

The current Melbourne Metro Rail Project concept includes a tunnel entrance (portal) at South Yarra to connect the Melbourne Metro tunnels to the Dandenong rail corridor, without the creation of platforms for Melbourne Metro services at South Yarra. As a result:

- Interchange between the Melbourne Metro (Sunbury to Cranbourne/Pakenham line) and other services (Frankston and Sandringham lines) will not be possible at South Yarra, although opportunities to interchange between the Sunbury to Cranbourne/Pakenham line and other services will exist at Caulfield for the Frankston line and at Flinders Street Station for both the Frankston and Sandringham lines;
- It will not be possible to travel directly between South Yarra and Domain via Melbourne Metro services (but tram and other public transport options will be available (as is the case today) and it will still be possible to travel between South Yarra and the CBD via the Frankston and Sandringham lines); and
- It will not be possible to travel to South Yarra directly on the Cranbourne and Pakenham lines (this would require interchange at Caulfield).

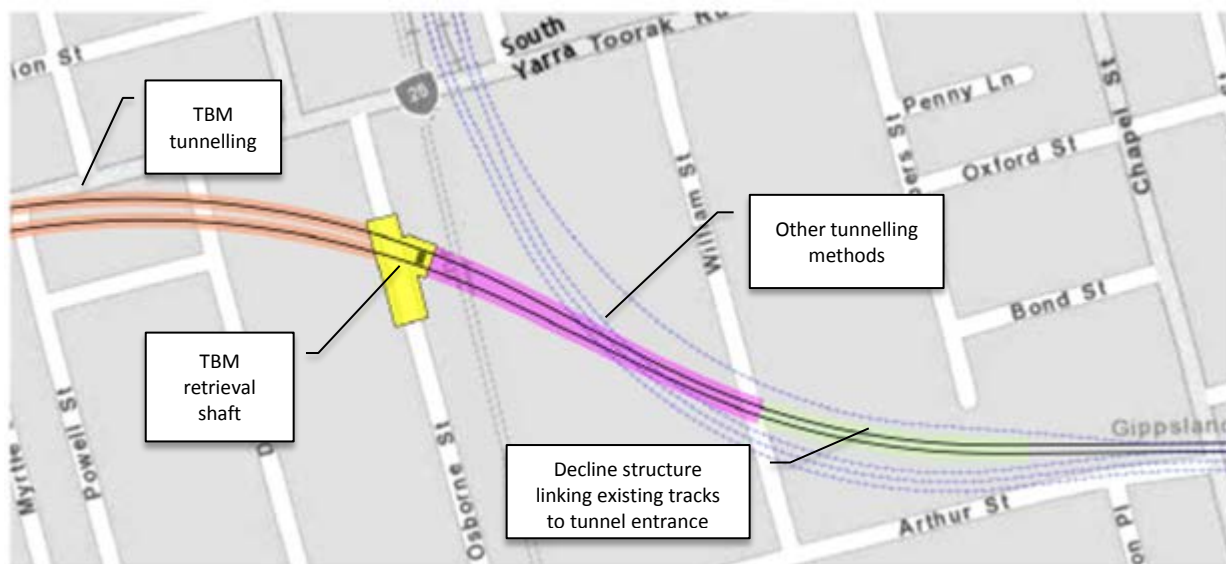
In simple terms, construction works in South Yarra are expected to involve:

- Tunnelling works using a Tunnel Boring Machine (TBM);



- Tunnelling works using other techniques (such as cut and cover or box jacking) for the final section as the tunnel approaches surface level;
- Works to realign the existing Cranbourne/Pakenham, Frankston and V/Line and freight tracks;
- A surface tie-in to connect the Cranbourne/Pakenham line tracks to the new Melbourne Metro tracks; and
- Removal of existing William Street Bridge and construction of a new pedestrian bridge.

**Figure 3-1: Overview of South Yarra works under Base Case**



The Base Case will require some property acquisitions to enable construction of the tunnel and the portal.

As noted above, these works are expected to require the demolition of the William Street Bridge to support the modified track arrangement. The track works will involve:

- Lowering both sets of Cranbourne/Pakenham line tracks to enable them to connect with the new underground line; and
- Raising both sets of Frankston line tracks and raising one set of V/Line freight tracks to enable the Cranbourne/Pakenham line tracks to pass underneath.

Due to the raised track levels, it is currently assumed that it will not possible to reinstate the William Street Bridge with vehicular access (i.e. because the bridge would be too steep). This will impact local access including neighbouring residential and commercial properties. A pedestrian bridge will be included and costed into the assumed scope of the Base Case to maintain a level of local access across William Street.<sup>2</sup>

It should be noted that potential track configuration changes currently under assessment in the vicinity of Caulfield have the potential to change the scope and construction methods set out above, in addition to adjustments that would ordinarily be made in the course of further developing the project.

### 3.3. Option A: new station with no direct interchange

Option A involves the provision of two Melbourne Metro platforms located to the west of the existing South Yarra Station and south of Toorak Road, as shown in Attachment A. In this option, the track works are limited to the west of Chapel Street to avoid affecting the Chapel Street Bridge and properties to the east of Chapel Street. This constrains track geometry, meaning that the station box cannot be constructed under the existing Sandringham line (mainly because the gradient would be too steep between the new underground platforms and the existing surface level

<sup>2</sup> The estimated cost of the pedestrian bridge is approximately \$2.6 million (P90) in today's dollars. This cost is not currently included in the cost estimates for the Base Case, which means that the incremental cost differences in Section 7 of this report may be overstated by approximately \$3 million. This is not material in the context of the total costs and has no bearing on the conclusions of this report.





Cranbourne/Pakenham line tracks immediately west of Chapel Street). Instead, the station box would need to sit west of the Sandringham Line.

As a result, under this option there is no interchange connection with the existing South Yarra Station within the paid zone. To move between the two stations, passengers would be required to exit the station and cross Toorak Road at street level, involving an estimated interchange time of approximately 5 minutes and 50 seconds between the Sandringham and Melbourne Metro platforms and 6 minutes and 40 seconds between the Frankston and Melbourne Metro platforms (centre of platform to centre of platform). This is suboptimal from a customer experience and connectivity perspective.

Option A would require the acquisition of a number of additional properties relative to the Base Case (discussed later), primarily to enable the construction of the station box.

This option would also require the demolition of the William Street Bridge to support the modified track arrangement. As with the Base Case, it is assumed that it would not be possible to reinstate the William Street Bridge with vehicular access due to the raised track levels (i.e. because the bridge would be too steep). This would impact local access including neighbouring residential and commercial properties. A pedestrian bridge has been included and costed into the assumed scope of Option A to maintain a level of local access across William Street.

### 3.4. Option B: new station with direct interchange

Option B involves the provision of two Melbourne Metro platforms located to the south of the existing South Yarra Station, as shown in Attachment B. In this option, the existing Sandringham line platforms would be relocated to south of Toorak Road, enabling a direct connection with the new platforms and therefore providing a direct interchange between Melbourne Metro and other services within the paid zone (i.e. without leaving the station).

It is estimated that it would take approximately 1 minute and 30 seconds to travel between the Sandringham and Melbourne Metro platforms and 4 minutes and 10 seconds to travel between the Frankston and Melbourne Metro platforms (centre of platform to centre of platform). This option would also provide access to the station from Chapel Street via Arthur Street, just south of the rail corridor.

To achieve this outcome it would be necessary to demolish and reconstruct Chapel Street Bridge. This could be undertaken in stages to maintain local access but would still involve significant disruption over a long time period (e.g. approximately one year), affecting the route 78 tram, road users, pedestrians and the Chapel Street precinct more broadly.

These works at Chapel Street Bridge would be necessary because the tunnel portal has been shifted to the east (relative to the Base Case and Option A) to enable the new Melbourne Metro platforms to be positioned under the relocated Sandringham line platforms, providing a direct connection to the existing South Yarra Station. As a result:

- Two new sets of tracks (depicted in red in Attachment B) are required through a section of the corridor to the east of Chapel Street alongside the realigned existing four sets of tracks (depicted in blue in Attachment B) in order to provide an appropriate alignment for the Melbourne Metro services; and
- The rail corridor in this section and Chapel Street Bridge need to be widened to accommodate these new tracks (i.e. because the cutting and the existing Chapel Street Bridge are not wide enough for six sets of tracks).

This is not an issue for the Base Case and Option A because the two new sets of tracks for these options can be constructed and connected to the existing tracks to the west of Chapel Street Bridge. This means that, for the Base Case and Option A, there will still be only four sets of tracks passing under Chapel Street Bridge.

William Street Bridge would also need to be demolished to enable construction works for Option B. However, unlike the Base Case and Option A, under Option B this bridge could be reinstated with vehicular access (the key difference being that for Option B the realigned existing tracks do not need to be raised to the same extent at William Street due to the portal shifting east).

Option B would require the acquisition of a number of additional properties relative to both the Base Case and Option A to enable construction of the station box and would also affect properties along the southern side of the rail reserve to the east of Chapel Street, including the Jam Factory where the impact is expected to involve preventing access to the



loading dock, the acquisition and closure of several businesses and other disruption during construction (discussed later).

In the longer term, there may be a need to provide additional tracks between South Yarra and Caulfield, driven by the growth in freight to the south east. The need for these tracks will be assessed as part of assessing options for a future port. Were these tracks required, there would be a variety of options to consider, including provision of additional surface tracks along the existing corridor and tunnelled solutions. If surface tracks were the preferred solution, Option B would have an advantage in that it provides additional tracks under the Chapel Street bridge. Given the uncertainty regarding future requirements, this is not considered a material advantage of Option B.



## 4. Approach to demand forecasting

PTV has undertaken modelling using the Victorian Integrated Transport Model (VITM) for the project with and without a South Yarra interchange station. This model forecasts trips across all modes, including trains, trams, buses and private car. This enables a comparison of projected traveller behaviours and the relative benefits and transport network impacts of each option.<sup>3</sup>

It is assumed under all scenarios that Melbourne Metro services will commence in 2026.

PTV's modelling of the "with station" scenario, to compare to the Base Case, has been undertaken on the basis of a direct interchange at South Yarra (i.e. Option B). All "with station" travel time benefits identified in Section 6 and all economic benefits identified in Section 8 are therefore based on an assumption that there would be a direct interchange between the new Melbourne Metro platforms and the existing South Yarra Station (i.e. within the paid zone), as in Option B. Given that Option A involves longer interchange times and would involve passengers needing to leave the paid zone and cross Toorak Road to travel between the new Melbourne Metro platforms and the existing South Yarra Station, the travel and economic benefits outlined in this report are overstated for the purposes of assessing Option A.

<sup>3</sup> "Unconstrained" forecasts (i.e. forecasts not constrained by the capacity of trains) have been used for this analysis to best reflect customers' preferred travel choices. Future years modelled were 2031 and 2046.



## 5. South Yarra Station & Network Context

### 5.1. Current status

South Yarra is currently the 11<sup>th</sup> busiest station in the metropolitan rail network (excluding transfers – i.e. based only on entries/exits and not including passengers who change trains). There is currently service on average every 110 seconds in each direction in peak periods (over two hours) and this is planned to improve to 95 seconds before Melbourne Metro opens.

### 5.2. Projections without new Melbourne Metro station at South Yarra

It is currently envisaged that there will be a service on average every 120 seconds in peak periods once Melbourne Metro opens. While this is slightly less frequent than current peak services, trains on the Frankston and Sandringham lines, which service South Yarra, will be less crowded. As part of this service plan, there will be a short-starter service from South Yarra or a short distance further south along the Sandringham Line (meaning that trains will start empty or almost empty during peak travel times enabling passengers to more easily find a seat).

It is also noted that service frequencies at South Yarra (i.e. Frankston and Sandringham lines) are planned to be increased to meet demand growth in the longer term, with peak period services in the future being more frequent than the 95 second service offered before the project.

A comparison of service levels shortly before Melbourne Metro opens and the opening service plan is provided at Attachment C. This also shows some of the alternative links that customers might use, who would otherwise interchange at a new South Yarra station if it were built.

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### 5.3. Projections with new Melbourne Metro station at South Yarra

If a new interchange station is built at South Yarra, it is expected that there will be a peak period service every 75 seconds once Melbourne Metro opens (including trains on the Frankston, Sandringham, Cranbourne and Pakenham lines). The trains will be less crowded than at present due to the service uplift provided by Melbourne Metro and there will be short-starter services as described above.

By 2031, South Yarra Station (old and new combined) would be the 13<sup>th</sup> busiest on the network (excluding transfers) with approximately 34,000 daily station entrances/exits (excluding transfers).

To put this into context, the new Domain Station is projected to have a total of 66,000 entries and exits in 2031 if there is no Melbourne Metro interchange at South Yarra, and only 10% fewer than that if a South Yarra interchange is provided.



## 6. Benefits of adding a new station

### 6.1. Who would benefit (and who would be adversely affected)?

#### Overview

Over 100,000 customers per day would be a minute worse off if the South Yarra Interchange Station is included, compared to less than 14,000 customers who would be between one and ten minutes better off.

Around 2,000 – 3,000 of the customers who could benefit from the station may need to change their journey compared to today, either modifying their route or starting to interchange at Caulfield. The rest of the customers who would benefit would be getting a better journey than they do today, however their current public transport options are already relatively good (i.e. high frequency train or tram services available).

In aggregate (i.e. taking into account all journey time savings and all slower journey times), the addition of a new station at South Yarra would add an additional 1,500 hours of travel time per day for public transport users in 2031. While the customers experiencing longer journeys are only impacted by around a minute, they significantly outnumber those whose journey would be shortened, resulting in a net increase in travel times for public transport customers.

#### Background to the analysis

To understand how the inclusion of a South Yarra Interchange Station will impact on customers, key public transport market segments whose journey time could potentially increase or decrease were identified.

Because customers in the inner south east have a wide range of public transport options, it is challenging to isolate the exact number of people who would be affected positively or negatively by a potential interchange station – particularly those who would benefit, as most beneficiaries are located in the inner area. The figures in the table below therefore refer to all public transport customers who are travelling from one area to another area. Not all of them would actually take advantage of the option of using a South Yarra Interchange Station.

While it is difficult to isolate the beneficiaries, it should be emphasised that in aggregate all travel time impacts – both negative and positive – are captured in the modelling and therefore in the economics, summarised later in this report.

All journey times are based on Option B (i.e. assuming a direct interchange between the new and existing platforms). This means that time savings related to passengers interchanging at South Yarra will be overstated for Option A.

#### Customers who potentially benefit

A range of customers would potentially benefit from the increased connectivity of a South Yarra Interchange Station, totalling in the order of 20,000 customers (daily, 2031) as summarised below. Of these, the number expected to save more than 1 minute is estimated to be less than 14,000.

The single largest market of beneficiaries would be those travelling between the Sandringham Line and Domain, accounting for around 40% of all potential beneficiaries of a new interchange station. Some of these customers may still be better off continuing to use one of the seven tram routes linking the Sandringham Line to St Kilda Road, but many would opt to interchange at South Yarra to catch the train to Domain. Savings for this market range from 0 – 8 minutes.

The next largest market of potential beneficiaries are customers travelling between South Yarra and the CBD, accounting for one-third of all beneficiaries. For these customers, the travel time savings would be around half a minute on average. Not all of these customers would necessarily use the new interchange station, many would continue to use the Sandringham and Frankston Line services, particularly those from the Forrest Hill precinct for whom these would be the closest option, or customers destined for Parliament, Flagstaff or Southern Cross stations, which are not served by the Melbourne Metro line.








There are two smaller markets which are important as they would likely need to change their journey compared to today:

- Customers travelling from the Cranbourne/Pakenham lines to South Yarra, who would need to start interchanging at Caulfield to make this journey (<10% of potential beneficiaries, saving around 5 minutes if an interchange station were included); and



- Customers travelling between locations on the Sandringham Line and Cranbourne/Pakenham lines (<10% of potential beneficiaries). Some of these customers would continue using one of the 8 bus and tram routes that connect these corridors, while others who currently interchange at South Yarra would need to change their journey, so would be better off with a new interchange station. Overall journey time implications range from 0 – 10 minutes.

**Table 6-1: Who would potentially benefit from a new Melbourne Metro interchange station at South Yarra?**

Journey	Benefits of South Yarra interchange station	Estimated market size (daily, 2031)	Approx. impact on travel time (compared to Melbourne Metro with no South Yarra interchange)
South Yarra to CBD	<ul style="list-style-type: none"> <li>Three different service routes through the CBD – via the City Loop, via Melbourne Metro or through Flinders Street and Southern Cross. Without a new station there would only be two service routes.</li> <li>More frequent train services at South Yarra (peak hour trains every 30(!) minutes compared to every 2 minutes under Melbourne Metro with no South Yarra platforms).</li> </ul>	 6,700 – 7,400	<ul style="list-style-type: none"> <li>Average wait time reduced by approx. 30(!) seconds in peak periods</li> <li>Average wait time reduced by approx. 30(!) seconds in off-peak periods</li> </ul>
South Yarra to Domain	<ul style="list-style-type: none"> <li>Direct rail access to Domain, rather than using Toorak Road tram.</li> </ul>	 200 - 250	<ul style="list-style-type: none"> <li>5-8 minute saving</li> </ul>
South Yarra to Parkville	<ul style="list-style-type: none"> <li>Direct rail access to Parkville, rather than needing to interchange at Flinders Street.</li> </ul>	 600 - 700	<ul style="list-style-type: none"> <li>5-8 minute saving</li> </ul>
West (e.g. Sunshine) to South Yarra	<ul style="list-style-type: none"> <li>Direct rail access to South Yarra, rather than needing to interchange at Flinders Street.</li> </ul>	 800 - 900	<ul style="list-style-type: none"> <li>5 minute saving</li> </ul>
From Dandenong (or other stations on Cranbourne and Pakenham lines) to South Yarra	<ul style="list-style-type: none"> <li>These passengers can travel directly to South Yarra without changing trains, as is currently the case. Without the additional station the Melbourne Metro project will cause a new interchange at Caulfield.</li> </ul>	 1,700 – 1,900	<ul style="list-style-type: none"> <li>5 minute saving</li> </ul>
People travelling from the Sandringham or Frankston lines (bayside or inner south east) to the Domain precinct of St Kilda Road	<ul style="list-style-type: none"> <li>A new station would enable these passengers to interchange at South Yarra to catch the Melbourne Metro service to Domain. Without a new station these passengers will need to continue to catch a tram from South Yarra (or any of the six other tram routes connecting the Sandringham Line to St Kilda Road) or interchange at Flinders Street to travel south.</li> </ul>	 8,000 – 8,800	<ul style="list-style-type: none"> <li>0-8 minute saving</li> </ul>
People travelling between locations on the Sandringham line and the Cranbourne / Pakenham lines	<ul style="list-style-type: none"> <li>These passengers would have the option of travelling in and out with one change at South Yarra, as is currently the case. Without a new station these people will need to use one of the existing 8 bus or tram services (as many people do today).</li> </ul>	 1,200 – 1,300	<ul style="list-style-type: none"> <li>0 - 10 minute saving (Journey time saving for customers who travel by rail, but no change for tram or bus passengers)</li> </ul>



Source: PTV

### Customers who would have longer journey times

A number of groups would be negatively affected by the addition of a Melbourne Metro station at South Yarra, as summarised below. In total, this amounts to around 100,000 – 110,000 customers (daily, 2031) who would have their journey time extended by one minute.



**Table 6-2: Who would be adversely affected by a new Melbourne Metro interchange station at South Yarra?**

Journey	Negative impact of South Yarra interchange	Estimated market size (daily, 2031)	Approx. impact on travel time (compared to Melbourne Metro with no South Yarra interchange)
People travelling from the Cranbourne/Pakenham lines to destinations beyond South Yarra (e.g. from the south east to Domain, the CBD, Parkville, or beyond) or vice versa	<ul style="list-style-type: none"> <li>These passengers will experience longer journey times as a result of the additional stop at South Yarra.</li> </ul>	 <p>93,000 – 102,000</p>	<ul style="list-style-type: none"> <li>Additional 1 minute journey time</li> </ul>
People travelling from the Frankston line to Domain, Parkville or other stations on the Sunbury line beyond the CBD	<ul style="list-style-type: none"> <li>These passengers can interchange at Caulfield under either scenario but will experience longer journey times if there is Melbourne Metro interchange at South Yarra due to the additional stop.</li> </ul>	 <p>8,400 – 9,200</p>	<ul style="list-style-type: none"> <li>Additional 1 minute journey time</li> </ul>

Source: PTV

**Customers who have a neutral outcome, but may change their journey**

There is also a customer market segment who may change their journey in response to inclusion of a South Yarra interchange option even though it may make a negligible or neutral difference to their journey time. These customers are taking up the option to interchange at South Yarra rather than another location simply because the option is there. Included are customers who will need to change between trains to travel to a particular City Loop station, or to destinations further afield – such as from somewhere on the Cranbourne/Pakenham line to somewhere on the Werribee line, or from Sandringham to Sunshine.

If no interchange station at South Yarra is built, these customers will change at locations such as Caulfield, Flinders Street and Melbourne Central. This behaviour is reflected in the modelled increase in interchange at South Yarra station when the South Yarra interchange option is included, set out in the next section.

**Geographic distribution**

The impact on public transport customers of a new Melbourne Metro interchange station at South Yarra is illustrated in the diagram overleaf. This shows the origin of customers who benefit and those who would have a longer journey. Each circle indicates the net travel time impact for all customers in that location, with the size of the circle representing the overall size of the impact. Blue circles are benefits (net travel time reductions) and orange circles are negative impacts (net travel time increases).

Key features of this map include:

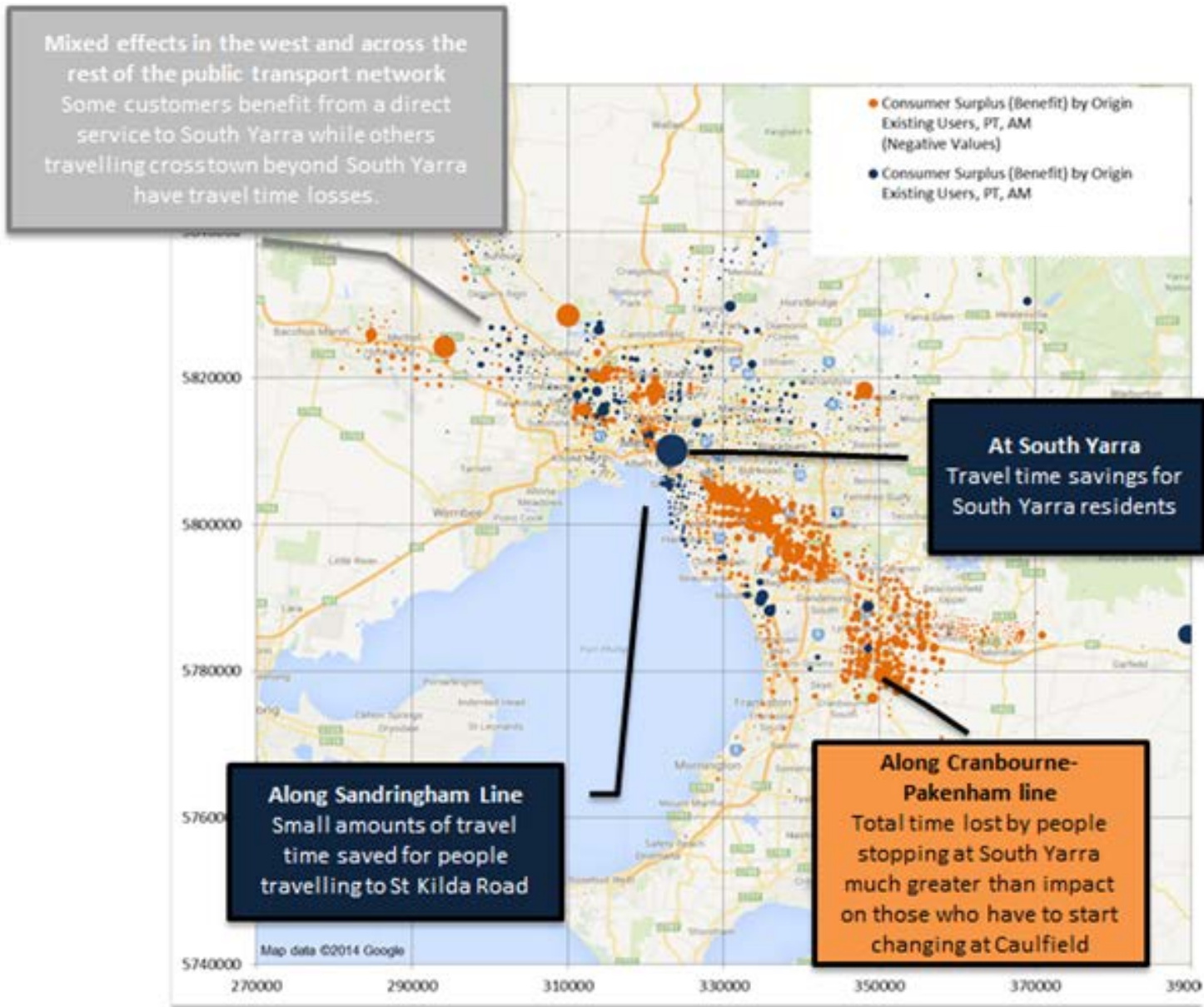
- A substantial blue circle at South Yarra, reflecting the fact that South Yarra residents only have travel time savings (i.e. these are not netted out by travel time impacts, like other locations where there might be a mixture of positive and negative impacts), and that there is a concentrated population of beneficiaries in this zone;
- A sweep of smaller blue circles along the Sandringham Line, reflecting customers who benefit from interchanging at South Yarra to access Domain, rather than catching one of seven tram services to St Kilda Road;
- A concentration of orange circles along the Cranbourne and Pakenham lines, due to the net effect of:



- A market estimated at around 1,700 – 1,900 customers who have to start interchanging at Caulfield, so would be better off by around 5 minutes if a new South Yarra station was included; and
- A market of approximately 100,000 customers who would be worse off by one minute if the South Yarra interchange station was added, more than offsetting the travel time benefits of the first group.







Source: PTV

Figure 6-1: Customers who benefit (blue) and those who lose time (orange) due to addition of a South Yarra interchange station, AM peak, 2031



## 6.2. Impact on public transport network

### Overview

This section summarises the modelled outcomes for the public transport network. While the market analysis in the previous section helps to explain these results, the wide range of public transport options in the inner south east means that modelled behaviour does not map directly against the market segments. The modelling also picks up the potential for mode shift, whereas the market analysis was focussed on existing public transport markets.

### Overall impact on rail patronage

The addition of a Melbourne Metro station at South Yarra is expected to lead to an increase in public transport use by 1,000 customers per average weekday in 2031. This reflects the net impact of:

- New public transport customers who are attracted to the benefits of a new interchange station at South Yarra, predominantly coming from South Yarra or the Cranbourne, Pakenham or Sandringham lines;
- Some travellers being deterred from using public transport, generally along the Cranbourne/Pakenham line as a result of the increased travel time caused by the additional stop at South Yarra<sup>4</sup>; and
- The area around South Yarra being rich in public transport services and therefore any improvements having only a small effect on increasing patronage.

To put this into context, the new station at Southland (estimated capital cost of approximately \$21 million) is projected to lead to an overall increase of approximately 4,000 customers per day.<sup>5</sup>

### Impact on patronage at South Yarra

In 2031, the addition of a Melbourne Metro station at South Yarra is projected to result in:

- Increased use of trains at South Yarra:
  - If a new interchange station were added at South Yarra, this would have local benefits for South Yarra. The number of entries and exits at South Yarra (existing and new stations combined) has been modelled to be around 11,000 higher per day than the Base Case without the addition of this station (this represents an increase of approximately 50% compared to South Yarra without the additional interchange station).
  - Of these entries and exits, approximately 6,000 are drawn from people who would otherwise use Domain Station and 5,000 are people who otherwise would not catch the train (including people who would use trams instead or not use public transport at all).
- Increased interchanging between trains at South Yarra:
  - The additional station at South Yarra would duplicate other interchange opportunities available elsewhere in the network, causing a rebalancing of the locations at which people change services;
  - Inclusion of an interchange station at South Yarra has been modelled to show a major increase in the number of customers changing trains at South Yarra, compared to the forecast if no additional station is built as part of MMRP. Approximately 33,000 more rail-rail interchanges would occur daily at South Yarra if the station was added to the project (an increase of over 700% compared to the number of interchanges at South Yarra without the additional station);
  - These interchanging customers can all be accounted for elsewhere in the public transport network in the scenario where there is no additional station, so do not represent an increase in public transport use. Three quarters of interchanging customers would otherwise change trains at another station (primarily Caulfield, Flinders Street or Melbourne Central), while one-quarter would otherwise change from train to tram to access St Kilda Road;

<sup>4</sup> This is not to suggest that when a new timetable is introduced with an increase in travel time by a couple of minutes to stop at a new station that a large number of people would immediately stop using public transport. However, PTV studies have shown that customers are very sensitive to even a few minutes difference in travel time. In future years, the amount of patronage on the Cranbourne and Pakenham lines has been modelled to be higher if no South Yarra station was provided as part of Melbourne Metro than if the project did include this station.

<sup>5</sup> Southland Station does not form part of the Melbourne Metro Rail Project.



- The modelled number of interchanges was based on Option B. The design of Option A would likely deter many customers from interchanging at South Yarra.

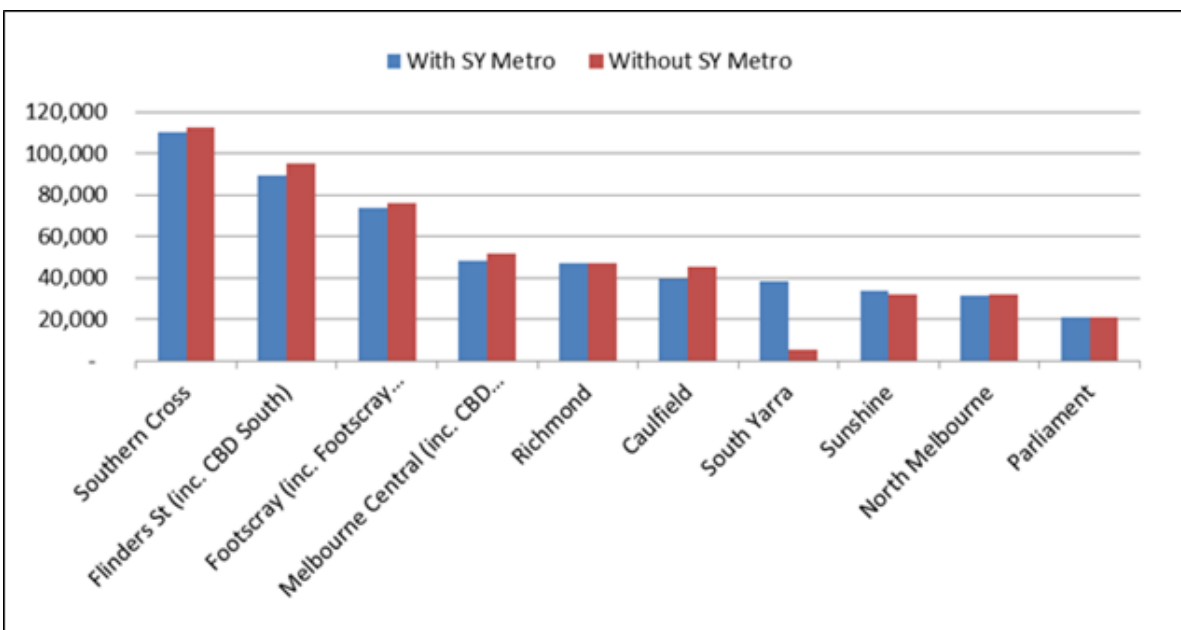
### Impact on other stations

Overall, the Melbourne Metro project relieves busy CBD stations but increases the use of other key interchange stations such as Caulfield and Footscray. The addition of a Melbourne Metro station at South Yarra would marginally increase the relief at CBD stations and provide some relief at other stations because the increase in passenger interchanges at South Yarra results in fewer interchanges at other stations.

Rather than causing a significant reduction at any one particular station, the additional transfers at South Yarra are drawn from several stations across the network.

The biggest single shift is from Caulfield, which is projected to see approximately 6,000 fewer daily interchanges in 2031 if a new Melbourne Metro station is provided at South Yarra. However, Caulfield will still be an important interchange and a busy station, with 39,000 daily interchanges expected in 2031 (ranking the 6<sup>th</sup> highest for interchanges across the network), even with a Melbourne Metro station at South Yarra. This means that, even with a Melbourne Metro station at South Yarra, Caulfield would need to cope with 50% more customers than today – meaning that Caulfield Station will exceed the capacity of its existing facilities and most likely need to be upgraded irrespective of whether a new interchange is included at South Yarra.

Figure 6-2: Daily station interchanges in 2031 (with and without new South Yarra interchange)



Source: PTV

### Comparison between South Yarra and other busy stations

Compared to other busy stations, South Yarra will have a very high number of train services whether a new station is added or not. It will have more trains servicing it than Parkville or Domain.

In particular, as illustrated below, the service level proposed for South Yarra compares well to stations at other busy locations in inner Melbourne, such as Parkville and Footscray, particularly when patronage is taken into account.



**Table 6-3: Peak services and patronage for selected stations (2031)**

Station	No. of services in 2 hour AM peak (inbound)	Boardings & alightings in the 2 hour AM peak (inbound services only)	Average no. of people getting on & off per train
South Yarra – no Melbourne Metro interchange	30(1)	7,700	130
South Yarra – with Melbourne Metro interchange		17,400	180
Parkville		7,000 <sup>6</sup>	200
Footscray (excl. regional services)		58,100	170
Camberwell		5,700	135
Richmond		29,500	255

Source: PTV

To highlight just one example, South Yarra with no Melbourne Metro interchange will have approximately 87% of the peak hour service frequency of Footscray Station for approximately 13% of the passengers.

#### Impact on train crowding

Inclusion of a South Yarra interchange station means both an increase in the number of trains and an increase in the number of customers on services travelling through the station. Furthermore, more people are using the station. This leads to an increase in the average load on trains departing South Yarra, resulting in an increase in train crowding.

This increase includes more people from the Sandringham line and stations between Caulfield and South Yarra changing onto trains from the Cranbourne-Pakenham line at the busiest point to travel one station to Domain. They would do this instead of catching the tram along Toorak Road or any of the other trams that interchange with the Sandringham line. Note that the short starter service is factored in to both project scenarios – with and without an additional South Yarra station.

Some people in the south east who currently use the direct St Kilda Road tram could also divert onto the Sandringham line, changing at South Yarra to travel one stop to Domain.

The diversion of customer from tram to train in the inner south east means that adding a South Yarra interchange station results in less efficient use of train capacity.

#### Impact on trams

The Melbourne Metro Rail Project (without an interchange station at South Yarra) will relieve crowding on trams on St Kilda Road by around 30%. The project does this by relieving the peak load point on this tram corridor (which in the morning peak occurs in the south bound direction at Federation Square), using the counter-peak train capacity to carry people from the CBD to Domain Station. Including a South Yarra interchange station reduces the number of customers travelling on St Kilda Road trams from the south east, but makes minimal further impact to the overall peak loading on trams travelling along St Kilda Road.

### 6.3. Impact on road congestion

<sup>6</sup> A total of 23,000 boardings and alightings are projected for Parkville during the 2 hour morning peak if outbound services are included (i.e. Parkville Station is expected to experience significant demand from people travelling north from the CBD). Note that this latest demand modelling is also based on a redistribution to projected land use that was undertaken in 2014, which shifted some jobs from Parkville and Arden to Fishermans Bend in line with planning for the Melbourne Rail Link project. It is not necessarily reflective of the latest projections and may understate use of Parkville Station.



Overall, the addition of a station at South Yarra would slightly reduce vehicle kilometres by 20,500 per day in 2031 as a result of the increase in public transport patronage (that is, as a result of more people using public transport rather than driving).

This increases the overall reduction in vehicle kilometres achieved by the Melbourne Metro project (with no interchange at South Yarra) by 0.02%, suggesting that the inclusion of a Melbourne Metro interchange station would have a negligible incremental impact on road congestion.

#### 6.4. Other externalities

The addition of a Melbourne Metro station at South Yarra is also expected to result in other benefits, including minor reductions in carbon dioxide emissions, minor reductions in road traffic accidents and some positive health benefits as a result of increased walking.



# 7. Costs

## 7.1. Construction costs

Construction cost estimates have been prepared to determine the incremental capital costs associated with incorporating Option A or Option B into the Melbourne Metro Rail Project (i.e. the incremental cost increase when compared to the Base Case). These cost estimates have been prepared in nominal dollars (i.e. including assumed escalation) and include contingency and risk allowances.<sup>7</sup>

**Table 7-1: Incremental construction cost estimates (nominal)**

Construction cost – incremental cost increase	Option A	Option B
Estimated construction cost (incremental increase relative to Base Case)	+\$494 million	+\$657 million

The following should be noted in relation to these cost estimates:

- The above estimates are a guide to inform the South Yarra options assessment and are not to be used for budgetary purposes. Further work is required, for example, to refine the options and to develop a construction methodology.
- It has been assumed for both Option A and Option B that the works at South Yarra will not trigger a requirement to upgrade the existing South Yarra Station. As such, no allowance has been made for upgrading the existing station.
- No allowance has been included in Option A or Option B for a tram stop upgrade on Toorak Road.
- No allowance has been made for any decking over rail lines to enhance development in the precinct (although partial decking is required and has been costed for Option B to facilitate a direct connection from the south side of Toorak Road to the relocated Sandringham and new Melbourne Metro platforms). Decking could be undertaken for either station option, or for the project as it is proposed (without a station), but would have greatest synergies with Option B. Either way, it would be a significant additional cost.

## 7.2. Property and business disruption costs

The inclusion of a South Yarra interchange station significantly increases the extent of land acquisition, primarily to enable construction of the station box and, for Option B, as a result of acquisitions required along the rail corridor to the east of Chapel Street.

The estimated increases in property and business disruption costs are summarised below. As above, these cost estimates have been prepared in nominal dollars and include contingency and risk allowances.

**Table 7-2: Incremental property and business disruption cost estimates (nominal)**

Property cost – incremental cost increase	Option A	Option B
Estimated property & business disruption costs (incremental increase relative to Base Case)	+\$206 million	+\$313 million

The following should be noted in relation to these estimates:

- The above estimates are not based on formal valuations and are to inform the South Yarra options assessment only. The numbers are a guide and are not to be used for budgetary purposes. Further work is required, for example, to refine the options and to develop a construction methodology.

<sup>7</sup> The costs in this report are based on the P90 estimates. Given the level of design work undertaken, this is considered the most appropriate figure to inform decision-making.



- The figures above relate solely to assumed freehold acquisitions. The costs associated with potential strata acquisitions have not been included.
- Nominal cost estimates have been derived based on assumed current market values, assumptions about property condition and an assumed rate of escalation. This may not reflect the actual value of the properties at the time of acquisition.
- Disruption costs have been included for business relocation and loss of profits compensation for premises assumed to be directly affected by the project.
- Further work is being undertaken to refine the concept design for the Base Case with a view to reducing the property impacts.

### 7.3. Total incremental capital cost

Based on the above, the net capital cost increase associated with including a South Yarra interchange station would be in the order of \$700 to \$970 million.

**Table 7-3: Total incremental capital cost (nominal)**

Incremental capital cost increase	Option A	Option B
Additional construction costs	+\$494 million	+\$657 million
Additional property and business disruption costs	+\$206 million	+\$313 million
<b>Total incremental capital cost increase</b>	<b>+\$700 million</b>	<b>+\$970 million</b>

### 7.4. Operating costs

Including a South Yarra interchange station would increase the operating costs relative to the Base Case, both in terms of higher maintenance costs (due the additional infrastructure) and the station operations (for example, staffing, and cleaning additional platforms). This is a minor cost but has been incorporated into the economic assessment in the next section.



# 8. Impact Assessments

## 8.1. Economic impacts

### Cost Benefit Analysis

As discussed in Section 6, the inclusion of a Melbourne Metro interchange station at South Yarra would provide benefits to some public transport users and would negatively impact (or “dis-benefit”) others. There would also be benefits and dis-benefits associated with road congestion and other externalities.

PTV has undertaken economic analysis based on the demand projections from VITM to determine the Benefit Cost Ratio (BCR) of adding a South Yarra interchange station to the scope of the Melbourne Metro project.

The estimated economic impacts of including an interchange station at South Yarra are summarised in the table below. All journey time savings are based on Option B (i.e. assuming a direct interchange between the new and existing platforms). This means that the economic benefits associated with travel time savings will be overstated for Option A. As such, the economic analysis in the table below has been based on the costs associated with Option B.

Unusually for a public transport project, the South Yarra interchange station creates negative benefits for public transport customers. This is because the travel time benefits it offers are relatively small and are offset by travel time impacts, with a net result of an increase in journey times for public transport customers. Overall, there is still a small mode shift of 1,000 additional public transport customers per weekday in 2031, and this does create some small benefits to road users, with associated societal benefits.

**Table 8-1: Estimated economic impacts**

Incremental economic benefit / dis-benefit	Economic Impact (Present Value <sup>8</sup> )	Comments
<b>Economic costs (based on Option B)</b> <i>Based on construction costs, property costs and operating costs</i>	<b>\$644 million</b> <b>(increase in project costs)</b>	Based on estimated capital costs plus operating & maintenance costs (small).
<b>Economic benefits</b>	<b>\$108 million</b> <b>(increase in project benefits)</b>	
<i>Benefits made up of:</i>		
<i>Public transport consumer surplus</i>	<i>-\$39 million</i> <i>(reduction in project benefits)</i>	Project benefits reduced due to net increase in journey times.
<i>Highway (car driver) consumer surplus</i>	<i>\$4 million</i> <i>(increase in project benefits)</i>	Project benefits increased due to reduced vehicle kilometres.
<i>Unperceived / misperceived cost of travel</i>	<i>\$4 million</i> <i>(increase in project benefits)</i>	A number of economic costs are not fully perceived by users and factored into day-to-day travel choices (e.g. non-fuel car operating costs such as registration, insurance and maintenance). Reductions in these costs result in a change in resource consumption and provide an economic benefit because these resources can be applied for more productive uses.
<i>Other societal benefits</i>	<i>\$34 million</i> <i>(increase in project benefits)</i>	Project benefits increased due to: <ul style="list-style-type: none"> <li>• Reduced CO2 and other emissions</li> <li>• Reduced road traffic accidents</li> <li>• Health benefits due to increased walking.</li> </ul>
<i>Residual value of land and infrastructure (based on Option B)</i>	<i>\$105 million</i> <i>(increase in project benefits)</i>	Based on: <ul style="list-style-type: none"> <li>• the assumed value of surplus land which can be sold once construction is completed (i.e. land acquired but not required post construction)</li> <li>• the assumed residual value of the new rail</li> </ul>

<sup>8</sup> Based on a real discount rate of 7%. Infrastructure Australia guidance recommends that BCRs be stated using real discount rates of 4%, 7% and 10% and sensitivity analysis has therefore been undertaken using the alternative discount rates.





Incremental economic benefit / dis-benefit	Economic Impact (Present Value <sup>8</sup> )	Comments
		infrastructure at the end of the assumed project life (30 years).
<b>Total net present value</b>	<b>-\$535 million (negative net present value)</b>	A South Yarra interchange would reduce the net present value of the project.
<b>BCR</b>	<b>0.2</b>	This reflects that there is a present value social-economic return of 20 cents per dollar spent.

Source: PTV

Sensitivity analysis has been undertaken and the results are summarised below. This shows that the economic impact remains negative and BCR below 1.0 when:

- Costs are reduced to align with Option A;
- Dis-benefits relating to travel time increases are removed, with only positive benefits of the interchange station included in the assessment; or
- Different discount rates are applied (increasing or decreasing the value of future costs and benefits).

**Table 8-2: BCR sensitivity analysis**

Incremental economic benefit / dis-benefit	Economic Impact (Present Value)	BCR
Based on Option A cost and land assumptions <sup>9</sup>	-\$391 million (negative net present value)	0.2
Core economic result (Option B), with all dis-benefits relating to the one minute travel time impact for "through" customers removed	-\$437 million (negative net present value)	0.3
Core economic result, but with 4% real discount rate	-\$516 million (negative net present value)	0.4
Core economic result, but with 10% real discount rate	-\$477 million (negative net present value)	0.1

Source: PTV

Regarding the discount rate sensitivity tests above, it should be noted that the BCR rises with a lower discount rate, reflecting that with lower discount rates the present value of the benefits increases by a greater percentage than the present value of costs. More detail on the discounted economic costs and benefits for these scenarios is provided below.

**Table 8-3: Sensitivity of economic results to discount rate**

Discount rate sensitivity	4%	7%	10%
Economic costs	\$736 million	\$644 million	\$570 million
Economic benefits	\$258 million	\$108 million	\$53 million
<b>Total net present value</b>	<b>-\$477 million</b>	<b>-\$536 million</b>	<b>-\$516 million</b>
<b>BCR</b>	<b>0.4</b>	<b>0.2</b>	<b>0.1</b>

Source: PTV

The sensitivity analysis confirms that the incremental economic impact of including an additional Melbourne Metro station at South Yarra is poor.

### Wider Economic Benefits (WEBs)

The Cost Benefit Analysis (CBA) of transport (and urban renewal) projects have historically been based on the assumption of perfect competition. The presence of additional market imperfections (beyond those externalities typically identified in a standard CBA), means that the generalised cost of travel does not equate to the marginal social cost of

<sup>9</sup> The benefits will be overstated for Option A. The net economic impact and BCR will therefore be overstated in this sensitivity analysis.



transport supply. This divergence between price and marginal social cost gives rise to potential for additional impacts (benefits or costs) that are not captured in the conventional CBA.

These impacts, which have been typically excluded from 'conventional' CBA in the past, are now commonly referred to as 'Wider Economic Benefits' (WEBs). Over the past few years, WEBs have entered the project evaluation framework for significant transport infrastructure projects.

The National Guidelines for Transport System Management (NGTSM) is currently being revised and will incorporate detailed guidance on calculating WEBs.

Australian and overseas studies demonstrate that:

- WEBs tend to be higher for projects that have relatively strong conventional benefits (conventional BCR and NPV); and
- WEBs typically account for between 30% to 50% of total benefits (including conventional benefits and WEBs).

The conventional CBA undertaken by PTV for South Yarra option demonstrates that South Yarra has a BCR of 0.2. Consequently, it is reasonable to assume that a more detailed analysis that also considers WEBs is unlikely to make the South Yarra option viable from economic, social and environmental perspective.

## 8.2. Value capture

The term "value capture" can mean different things to different people. For the purposes of this options assessment the consideration of value capture has been limited to:

- Whether inclusion of an interchange station could result in property value uplift in the surrounding area;
- Whether inclusion of an interchange station could trigger additional development activity in the surrounding area; and
- Whether there would be new development or redevelopment opportunities associated with the land and physical infrastructure required for the interchange station ("over site development").

A summary of these value capture opportunities is provided below.

**Table 8-3: Potential value capture opportunities**

Value capture opportunities	Comments
Impact on local property values	<ul style="list-style-type: none"> <li>• Analysis has been undertaken to assess the potential residential property value uplift that might be expected to occur as a result of including a Melbourne Metro interchange station at South Yarra.</li> <li>• On the basis that South Yarra is already very well serviced by public transport, it is considered unlikely that inclusion of an interchange station would result in a widespread material property value uplift compared to a solution that excludes a station. The analysis indicates that the inclusion of a Melbourne Metro interchange station at South Yarra could result in local residential property value uplift of approximately \$50-100 million in today's dollars (spread across approximately 20,000 residential properties<sup>10</sup>).</li> <li>• While this uplift potential is not insignificant, it is not considered material compared to the cost of the station. It is also noted that any such value uplift could not currently be directly captured by the project (i.e. this value uplift would flow to residential property owners and would not directly offset the costs associated with including the new interchange). It also reflects and duplicates the economic benefits of the project, so should not be considered additive to the cost benefit analysis.</li> </ul>
Impact on development activity in the surrounding area	<ul style="list-style-type: none"> <li>• As noted above, South Yarra is already very well serviced by public transport and the addition of Melbourne Metro platforms is not expected to create a "tipping point" that would stimulate development in the area which would not otherwise have occurred.</li> <li>• Furthermore, it is noted that most development opportunities in the precinct, such as the Forrest Hill development, have already been exploited or are proposed to be exploited in the short to medium term, reducing the prospect that inclusion of a station might trigger broader redevelopment at South Yarra.</li> <li>• More restrictive residential zonings apply to a significant part of the area within walking distance of the station, limiting development opportunities that could occur around the station.</li> </ul>
Over site	<ul style="list-style-type: none"> <li>• As discussed in Section 8.3 below, extensive property acquisitions would be required in order to build a</li> </ul>

<sup>10</sup> The assessment of property value uplift for residential dwellings used census data from South Yarra and the surrounding suburbs to obtain a count of dwellings which fell within a 1,600 metre radius of South Yarra Station.



<b>development opportunities</b>	<p>Melbourne Metro station at South Yarra. Some of this land might be available for redevelopment once the Melbourne Metro construction works have been completed. For example, development might be possible above the station box (although this may involve additional costs in order to ensure that the station box is capable of accommodating over site development). However, the scale of any such development might be limited based on the low-rise nature of existing buildings in the immediate vicinity.</p> <ul style="list-style-type: none"> <li>• The construction works might also provide an opportunity to include decking either side of Chapel Street Bridge or elsewhere along the corridor, potentially providing an additional development opportunity. However, the potential proceeds from any sale of over site "air rights" would need to be considered against the additional costs associated with construction of the decking. It is also noted that decking opportunities would exist under all options, including the Base Case.</li> <li>• As noted in Table 8-1 above, the economic analysis is based on an assumption that all land acquired for construction purposes but not required thereafter will be sold once construction has been completed.</li> </ul>
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Source: Strategic Intelligence Group

Therefore, although value capture may provide an opportunity to partially offset the incremental costs associated with Option A or Option B, any additional value capture potential is not considered to be a material driver for this options assessment process.

### 8.3. Social impacts

Many social impacts associated with projected changes in public transport and road use (e.g. changes in journey times, health benefits from increased walking, etc.) have already been discussed and are captured in the economic analysis above. As previously discussed, the high existing levels of public transport services means that the social impact/benefit of public transport improvement in this area will be limited.

The cost estimates used for the purposes of the economic analysis include allowances for property acquisitions and certain disruption costs. However, there are likely to be social impacts of property acquisition and disruption which have not been factored into the cost allowances. It is also noted that the economic analysis did not consider the economic impact of disruption, such as increased journey times as a result of road or rail disruption during construction.

#### Impact of property acquisitions

The table below summarises the estimated number of properties required to be acquired for each of the options. This table reflects freehold title acquisitions only and excludes potential strata title acquisitions. The Base Case figures are still subject to refinement as discussed earlier, and Option A and Option B figures are based on a conceptual level of design, which would require greater refinement should either of these options be taken forward.

**Table 8-4: Estimated number of property acquisitions**

Land acquisition – freehold titles	Base Case	Option A	Option B
Number of affected buildings	4	41	45
Number of residential properties / titles	13	29	82
Number of commercial properties / titles	7	73	32
<b>Total number of properties / titles</b>	<b>20</b>	<b>102</b>	<b>114</b>

The inclusion of a Melbourne Metro station will therefore result in significantly more property acquisitions than under the Base Case. In particular, it is noted that:

- Option A is expected to result in an additional 16 residential title acquisitions; and
- Option B is expected to result in an additional 69 residential title acquisitions.

As previously discussed, it is also noted that Option B involves the partial acquisition of the Jam Factory. An alternative to acquiring the Jam Factory would be to acquire a new block of apartments, requiring the full acquisition of 2 fewer commercial titles but 147 additional residential titles.

#### Other social impacts

All options will result in rail, road and other disruption during construction. This report does not seek to identify all potential community impacts and focuses on the key points of differentiation between the options.

**Table 8-5: Other disruption impacts – key points of differentiation**



Other disruption	Base Case	Option A	Option B
<b>William Street Bridge</b>	<ul style="list-style-type: none"> <li>• <i>During construction:</i> Bridge will be demolished during construction.</li> <li>• <i>Post completion:</i> Expected to be reinstated as a pedestrian bridge (no vehicular access).</li> </ul>	<ul style="list-style-type: none"> <li>• <i>During construction:</i> Bridge will be demolished during construction.</li> <li>• <i>Post completion:</i> Expected to be reinstated as a pedestrian bridge (no vehicular access).</li> </ul>	<ul style="list-style-type: none"> <li>• <i>During construction:</i> Bridge will be demolished during construction.</li> <li>• <i>Post completion:</i> Expected to be reinstated with full vehicular access.</li> </ul>
<b>Chapel Street Bridge</b>	<ul style="list-style-type: none"> <li>• No impact.</li> </ul>	<ul style="list-style-type: none"> <li>• No impact.</li> </ul>	<ul style="list-style-type: none"> <li>• <i>During construction:</i> Bridge will be demolished in stages during construction. Restricted access will generally be possible throughout (possibly with limited short-term exceptions) but this is likely to cause significant disruption to road users, pedestrians and the route 78 tram for approx. 12 months.</li> <li>• <i>Post completion:</i> No impact.</li> </ul>
<b>Lovers Walk</b>	<ul style="list-style-type: none"> <li>• <i>During construction:</i> No community access to Lovers Walk.</li> <li>• <i>Post completion:</i> May not be possible to reinstate access.</li> </ul>	<ul style="list-style-type: none"> <li>• <i>During construction:</i> No community access to Lovers Walk.</li> <li>• <i>Post completion:</i> May not be possible to reinstate access.</li> </ul>	<ul style="list-style-type: none"> <li>• <i>During construction:</i> No community access to Lovers Walk.</li> <li>• <i>Post completion:</i> May not be possible to reinstate access.</li> </ul>
<b>Rail disruption</b>	<ul style="list-style-type: none"> <li>• All options will involve significant rail disruption during construction.</li> </ul>	<ul style="list-style-type: none"> <li>• All options will involve significant rail disruption during construction.</li> </ul>	<ul style="list-style-type: none"> <li>• All options will involve significant rail disruption during construction. However, the disruption would be most severe under Option B.</li> </ul>
<b>Other</b>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>	<ul style="list-style-type: none"> <li>• Construction works affecting Jam Factory will affect public enjoyment of these facilities.</li> <li>• Works at Chapel Street Bridge and Jam Factory may have negative consequential impacts on the precinct more broadly (e.g. fewer visitors).</li> </ul>

## 8.4. Environmental impacts

No detailed environmental impact assessment has been undertaken for the purposes of this options analysis. The potential environmental impact is not considered to be a key point of differentiation between the options.



## 9. Other investment options

This section outlines, at a high-level, some potential alternative investment options which may provide benefits to public transport users and/or the local community. However, these potential benefits are not directly comparable to the benefits that would be provided by a Melbourne Metro interchange station at South Yarra (i.e. they are not true “alternative” options).

These alternative network improvements do not form part of the current scope of the Melbourne Metro Rail Project. In fact, with the potential exception of upgrading Caulfield Station, the potential need for these alternative/additional works is wholly unrelated to the Melbourne Metro Rail Project.

### 9.1. Upgrade South Yarra Station

The existing South Yarra Station could potentially be upgraded. For example, this could involve:

- Extending the existing concourse;
- Constructing a new concourse at the northern end of the station;
- Upgrading vertical transport to enable compliance with the Disability Discrimination Act; and/or
- Adding a new entrance on Yarra Street (providing improved access for the Forrest Hill precinct which would reduce walk times between this fast-growing area and the existing station).

This could improve station access and amenity, reducing crowding at the main entrance on Toorak Road.

### 9.2. Upgrade tram stop at South Yarra Station

The existing tram stop outside South Yarra Station (stop 30) could be relocated to better connect with the station and upgraded into a “super stop”. This would achieve compliance with the Disability Discrimination Act, improve customer experience and facilitate better interchange between public transports modes.

### 9.3. ‘Village square’

The City of Stonnington’s *Chapel reVision* document outlines plans for a village square on Toorak Road. As discussed elsewhere in this report, it could be possible to deck over a section of the rail corridor at Toorak Road, thereby creating potential for additional open space and public amenity.

### 9.4. Upgrade Caulfield station

Caulfield Station is currently a busy station with poor interchange arrangements (passengers are required to leave and re-enter the station to change between lines). As discussed in Section 6.2, the Melbourne Metro project drives additional customers to interchange at Caulfield Station. The existing Caulfield Station could potentially be upgraded to improve customer experience, for example by building a new concourse at one end of the station and providing better connectivity between platforms.



## 9.5. Other initiatives to improve public transport in the south east

PTV is currently working to plan and deliver improvements to tram and bus services to simplify and improve priority, reliability and potentially travel times for public transport customers in the south east. For example:

- Public transport for people wishing to travel between the Sandringham and Dandenong lines could potentially be improved through improvements to tram and bus services (for example, to enhance tram services operating between Balaclava and Caulfield Stations).
- Other improvements could also benefit public transport customers wishing to travel from the south east to St Kilda Road and the CBD (for example, providing a Malvern Station to St Kilda Road tram service with a new tram to rail interchange at Malvern Station and/or providing a service from Caulfield Station to St Kilda Road with a new tram to rail interchange at Caulfield Station).



# 10. Conclusion

It is recommended that the Melbourne Metro Rail Project should proceed without adding a new station at South Yarra.

This recommendation is based on the following key findings:

- The inclusion of a Melbourne Metro station at South Yarra is expected to add in the order of \$700 million to \$970 million to the capital cost of the project.
- The economic case for including a new station is poor, with a BCR of approximately 0.2. The overall economic result of the Melbourne Metro project would be higher with no station at South Yarra (i.e. the inclusion of a South Yarra interchange station would reduce the project's BCR).
- South Yarra is well serviced by public transport, even without a new Melbourne Metro station. When Melbourne Metro services commence, South Yarra residents will have frequent train services (approximately every 2 minutes during peak hours) and a new short-starter service will be introduced (meaning that trains will start empty or nearly empty at South Yarra during peak hours).
- Over 100,000 customers per day would be a minute worse off if the South Yarra Interchange Station is included, compared to less than 14,000 customers who would be between one and ten minutes better off. In aggregate (i.e. taking into account all journey time savings and all slower journey times), the addition of a new station at South Yarra would add an additional 1,500 hours of travel time per day for public transport users in 2031.
- The construction of a new station at South Yarra would result in significant additional disruption for the local community. For example, the construction of a new station which enables direct interchange with the existing station is expected to involve:
  - The partial closure of Chapel Street Bridge for approximately 12 months, affecting road users, the route 78 tram, pedestrians and the Chapel Street precinct more broadly (whereas Chapel Street Bridge is expected to be largely unaffected if there is no new station); and
  - The acquisition of an additional 69 residential and 25 commercial titles at surface (including partial acquisition of the Jam Factory) compared to the project with no new station at South Yarra. An alternative to acquiring the Jam Factory would be to acquire a new block of apartments, requiring the full acquisition of 2 fewer commercial titles but 147 additional residential titles.



# Attachment A: Overview of station arrangements for Option A (new station with no direct interchange)

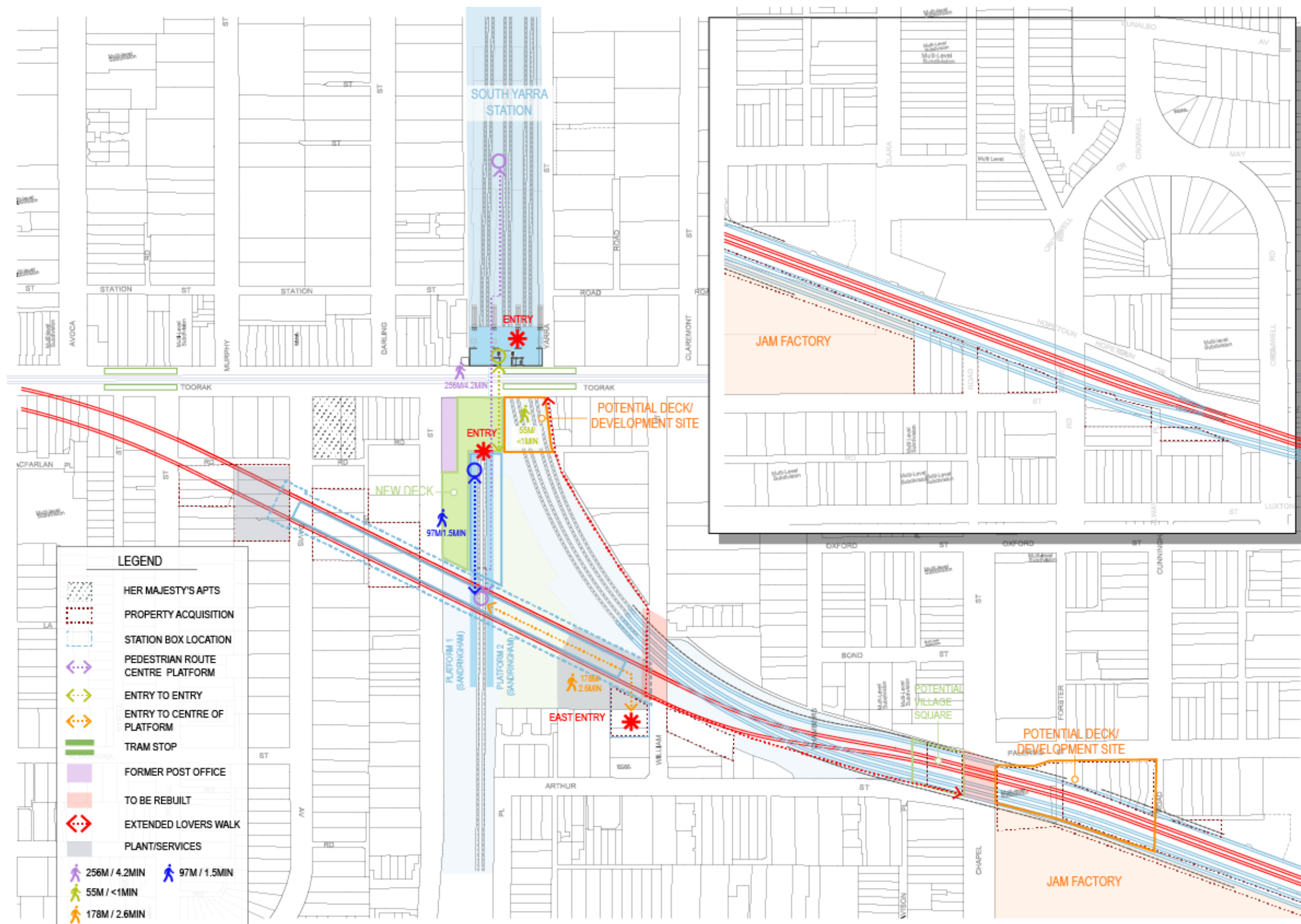


NEW TRACKS TIE INTO EXISTING WEST OF CHAPEL STREET



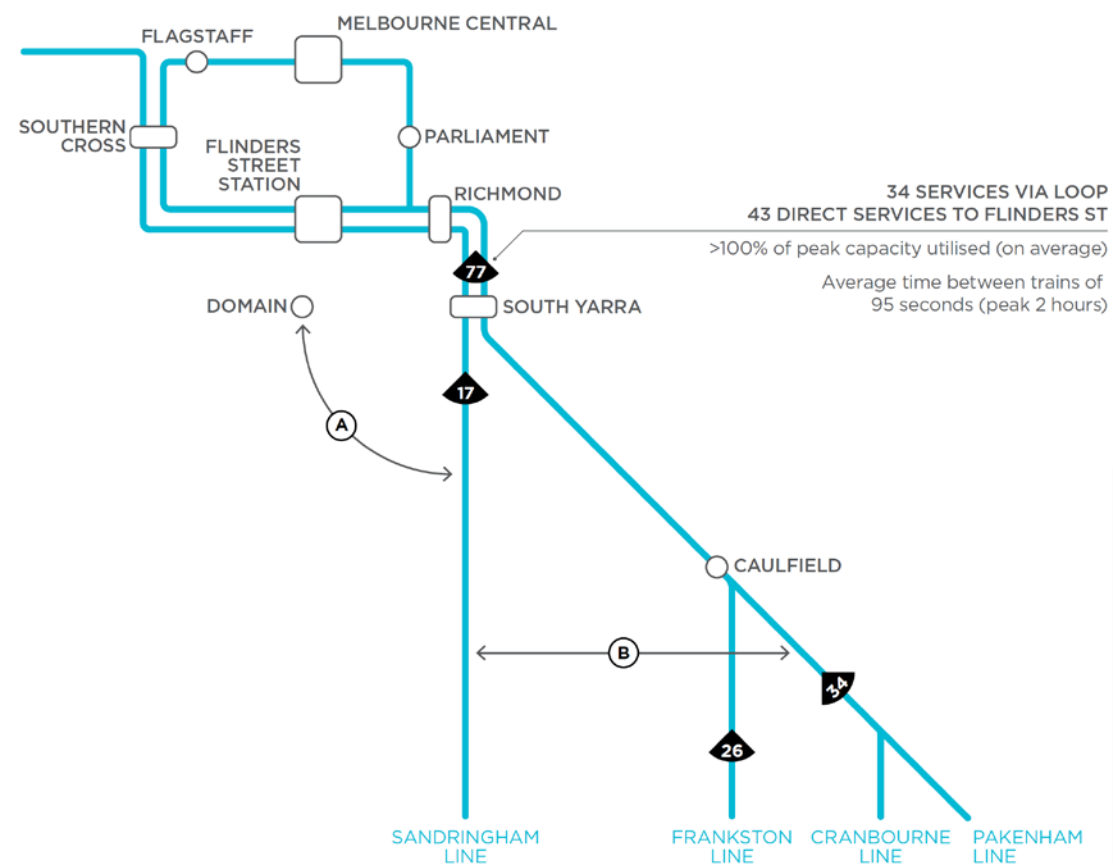


# Attachment B: Overview of station arrangements for Option B (new station with direct interchange)

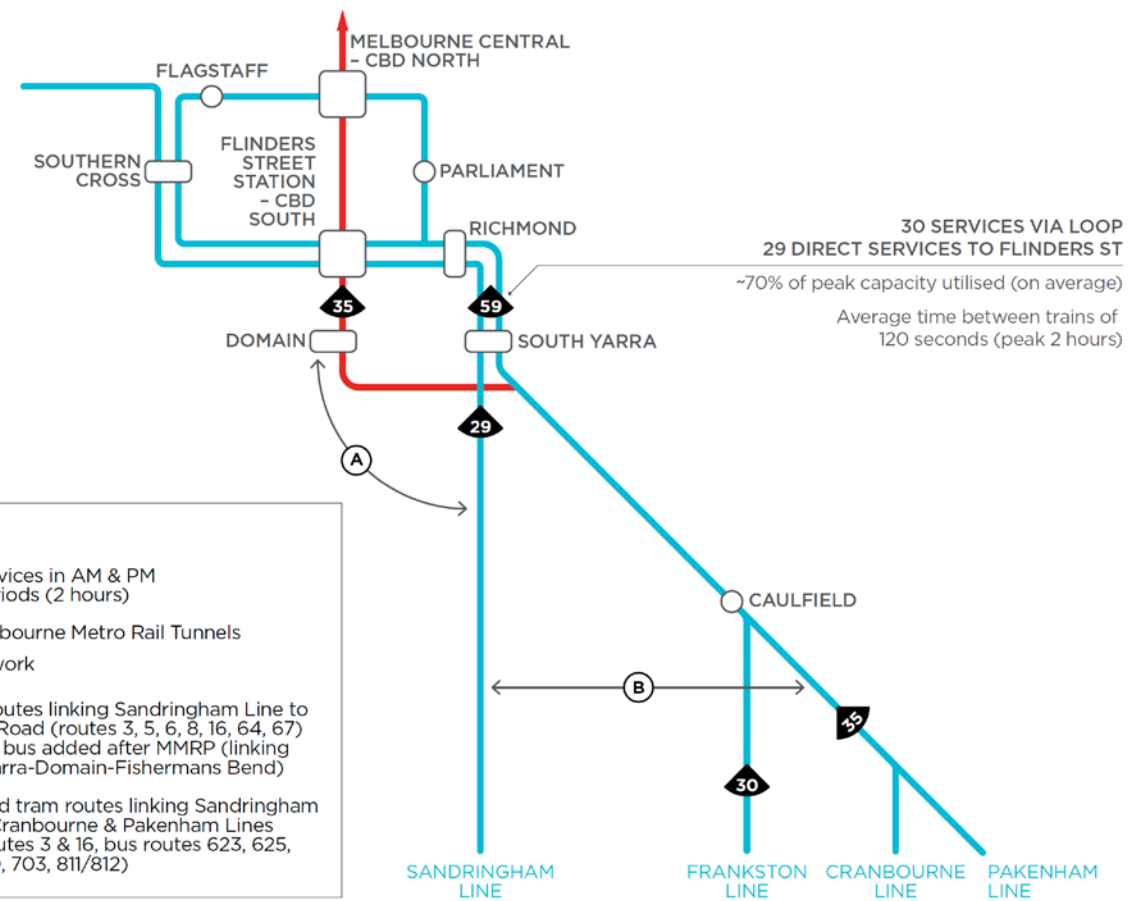


# PUBLIC TRANSPORT IN SOUTH YARRA

## BEFORE MELBOURNE METRO RAIL PROJECT



## AFTER MELBOURNE METRO RAIL PROJECT



**KEY**

- Train services in AM & PM peak periods (2 hours)
- New Melbourne Metro Rail Tunnels
- Rail network
- 7 tram routes linking Sandringham Line to St Kilda Road (routes 3, 5, 6, 8, 16, 64, 67) plus one bus added after MMRP (linking South Yarra-Domain-Fishermans Bend)
- 8 bus and tram routes linking Sandringham Line to Cranbourne & Pakenham Lines (tram routes 3 & 16, bus routes 623, 625, 626, 630, 703, 811/812)

**Before MMRP:**

- Trains are full
- Average time between trains at South Yarra is 95 seconds in peak
- Passengers from the Cranbourne/Pakenham lines can access South Yarra without interchange
- Passengers from Sandringham line can access St Kilda Road with 7 tram routes
- Passengers travelling between the Sandringham and Cranbourne/Pakenham lines can use the 8 bus and tram routes available to travel cross-town, or can travel in to South Yarra to interchange

**After MMRP:**

- Crowding greatly reduced (including due to “short starter” service, enabling South Yarra customers to get a seat in peak)
- Average time between trains at South Yarra is 120 seconds in peak
- Passengers from the Cranbourne/Pakenham lines can access South Yarra with one interchange at Caulfield, and those traveling to the city run express through South Yarra
- Passengers from Sandringham line can continue to access St Kilda Road with 7 tram routes plus one bus route
- Passengers travelling between the Sandringham and Cranbourne/Pakenham lines can continue to use the 8 bus and tram routes available to travel cross-town, or can travel in to Flinders Street to interchange



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